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Fuel and energy security challenges and policy between Australia, the UAE, and Israel

Executive Summary

Energy and fuel security is an important national security matter for any country, and has long presented challenges for many. As the world increasingly decarbonises and transitions to renewables policymakers and governments will further have to consider how to ensure energy security is maintained, or even increased.

Australia, the United Arab Emirates, and Israel all face unique challenges in their energy sectors. Whilst Australia and Israel face challenges in terms of import vulnerability, the United Arab Emirates faces its own challenges as it attempts to transition away from the oil industry that has driven its economic transformation in recent decades.

The paper looks at the needs, challenges, and policies of each country from the perspective of three different energy needs – transport, stationary domestic consumption, and export. Transport looks at the dependence on liquid fuels and the challenges faced by each country in maintaining the supplies they need. Domestic consumption looks at other domestic energy requirements such as electricity. Export looks at how countries rely on export of their energy products offshore, noting that economic and social stability can have substantial implications for national security.

Whilst each of the countries all had unique challenges, there are also similarities. Australia and the United Arab Emirates are both historically resource rich countries that have traditionally exported energy products overseas, and are now entering a world where there is less demand for such products. Australia and Israel are both dependent on imports to maintain liquid fuel security. All three countries have recognised the need for alternative energy sources, and are transitioning away from traditional methods of energy generation. They will all need to carefully consider how to maintain fuel and energy security during this transition.

The challenges and outlooks for all three countries have highlighted the need for policymakers to develop long term strategies and solutions to manage fuel and energy security in the future.

Australia

Overview

Australia's most pressing issue is its lack of liquid fuel security, which presents a substantial risk to its national security by leaving it highly vulnerable to global fuel supply issues. Australia also faces challenges in its domestic energy environment, which has become highly politicised and subject to vast debate. Australia also faces challenges in its export environment as the global market for coal continues to evolve and change.

Energy Needs and Challenges

Transport

Energy for transport in Australia is largely sourced through liquid fuels such as petrol, diesel, and jet fuel. Whilst electric vehicles are increasingly prevalent, Australia will continue to be heavily dependent on oil based fuel in the short and medium term. Australia's geographical profile in which major cities and urban centres are separated by vast distances and other challenges mean that Australia is heavily reliant on the continued transport of freight and people across long distances in order to maintain critical supply chains, as well as ensuring the continued operation of critical industries such as agriculture that are vital in order to maintain food security.

Ensuring that Australia has a secure supply of liquid fuel is a critical national security issue for the country. Australia has typically relied on a market based approach for its liquid fuel security needs. This has resulted in Australia's supply of liquid fuel becoming increasingly dependent on imports from overseas, with approximately 90% of Australia's liquid fuel needs being sourced offshore.¹ Compounding this issue is Australia's lack of fuel reserves. As a member of the International Energy Agency (IEA), and a signatory to their treaty *Agreement on an International Energy Program*, Australia has obligations to hold at least 90 days' worth of oil stocks. Australia is making progress in achieving this, however is still falling short, with data from February 2022 indicating that there is only 75 days' worth.²

Whilst this approach has largely served Australia well in the past, this is more a reflection of luck rather than resilience, with the system not having experienced a major supply shock in decades. Australia's lack of liquid fuel resilience whilst being dependent on a stable, consistent supply of fuel leaves it highly susceptible to any event which could impact its liquid fuel supply chains, such as a geopolitical incident or trade restrictions. Such a shock could have substantial consequences for Australia in terms of national security, food security as well as having substantial economic and social impacts.

Strategies that can help mitigate this risk include having a sizeable amount of onshore reserve stocks, ensuring supply chains are strong and diverse, having onshore refinery capability, and having robust and resilient distribution networks. The Australian Government fortunately appears to be addressing these issues. The 2020-2021 Federal Budget outlined measures that the government planned on taking, which included increasing the

¹<https://www.energy.gov.au/government-priorities/energy-security/australias-fuel-security-package>

²<https://app.powerbi.com/view?r=eyJrjoiY2RjYjUzYTMTMjBkZS00OGI1LWVhYjYtN2M3OGNmMzAzMTBjliwidCI6IjA3MDk5MWRKLWNkYjctNDc2Zi04MGRjLWU4YzNhOTFjNzBhZiJ9>

amount of onshore diesel storage available, minimum stockholding obligations for transport fuels, and increased support for the refining sector.³ A number of organisations have since been offered funding under this program.⁴

Stationary Domestic Consumption

The second category is energy required for stationary domestic consumption, such as electricity and gas. Electricity has been a controversial topic in recent years, and has seen supply concerns and transmission hiccups, with a particularly notable incident in 2016 when substantial storm damage on electricity transmission networks resulted in a loss of power across the entire state of South Australia.

Like liquid fuel, a stable supply of electricity is critical for Australia's national security. It is perhaps an issue that has not previously been analysed close enough from the perspective of national security sufficiently, although this has shifted in recent years through mechanisms such as a legislative changes and reviews.

Electricity has become a highly politicised topic for Australian Governments as the country shifts towards renewables. Energy policy been the subject of some of the most complex public debates as the country, which is resource rich and dependent on mining for a large portion of its economy, grapples with the need to transition to renewables whilst ensuring electricity remains available and affordable. Attempts at resolving the matter have been slow and ineffective, largely due to complicated and nuanced internal party politics, with policies such as the National Energy Guarantee being unsuccessful. Despite slow progress politically, energy companies have been retiring older power plants as they reach the end of their useful technical life, with further coal plants due to reach the end of their useful technical and economic life in the next five years. Whilst this presents challenges for the country, it also presents opportunities for investment and development of renewable and alternative energy. Australia has seen a significant amounts of such projects in recent years, with projects such as battery storage, and plans and interest for initiatives such as pumped hydroelectricity and green hydrogen.

Export

Australia capitalises on its vast natural resources through trade, and is a substantial exporter of energy, particularly coal and natural gas. These exports are a substantial contributor to the Australian economy.

Australia's energy export industry has faced challenges, and will continue to face challenges as the global market for these commodities evolves and changes. With these exports being an important contributor the Australian economy it is important that Australia carefully considers the present and future challenges for the sector.

Australia has always been a resource-rich nation, and for a long time as relied on the export of its natural resources (such as coal and natural gas) to support its economy. Increasing global pushes and commitments for sustainability, as well as other factors such as the imposition of export controls has forced Australia to consider its coal export future. Australian Governments and opposition parties have been reluctant to make firm policies and commitments surrounding the future of coal mining, with parties concerned about alienating mining communities in key areas. Smaller political organisations such as the Australian Greens have been more vocal about the need

³<https://www.pm.gov.au/media/boosting-australias-fuel-security>

⁴ <https://business.gov.au/grants-and-programs/boosting-australias-diesel-storage-program/grant-recipients>

to rapidly phase out the industry and pivoting the energy export sector towards alternative energies such as green hydrogen.

Outlook

Energy security policy has been long overlooked in Australia, however it is pleasing to see recent government commitments and attention towards addressing issues such as lack of liquid fuel reserves. Australia will likely continue to face challenges in terms of domestic energy supply and distribution, as well as potential economic issues associated with a changing global export environment. Australia is in need of a more comprehensive and holistic approach to its energy challenges, which in recent years has been patchy. Whilst initiatives such as battery storage programs have been implemented by some state Governments, national reform has proven difficult, with federal initiatives such as the National Energy Guarantee not only failing to get off the ground, but resulting in internal government tensions and a change in government leadership.

Australia will hold a federal election in May 2022. The outcome of this election will likely have consequences for Australia's domestic energy environment and will depend highly on the exact composition of Australia's next Parliament.

United Arab Emirates

Overview

As an oil rich country, the United Arab Emirates' does not face the same challenges as countries that are dependent on frequent and reliable imports, such as Australia and Israel. The UAE's challenges instead surround what a future beyond oil and fossil fuels will look like. As a country that has depended on fossil fuels and oil for its economic transformation and development, the United Arab Emirates faces unique challenges as it seeks to shift away from fossil fuel dependence.

The country has a strategic plan to reduce its usage of fossil fuels, and to transition to an economy which is not dependent on demand for oil. This plan is well considered, particularly in regards to the UAE's own domestic energy needs, and the UAE is unlikely to face major hurdles and challenges in terms of its own energy requirements. Whilst it is yet to be seen how well the UAE transitions its economy away from energy export, the country has a well-developed plan that inspires confidence and optimism.

Energy needs and challenges

The United Arab Emirates is a resource rich country. Throughout the UAE's rapid modernisation energy security and challenges have been far from a pressing priority, with the country being able to consistently meet and exceed its energy needs through its own vast resources. This continues to be the case today, however the need to shift away from fossil fuels is forcing the UAE to consider the future of its energy needs in a way that it has not had to do before. In particular, the UAE will face substantial economic challenges as it works out how to transition its oil dependent economy away from fossil fuels.

This is a challenge that the UAE has already recognised and is actively taking steps to address, and has made commitments to reducing emissions and increasing renewable energy usage within the country through international agreements such as the Paris Climate Accords. Domestically, the country has also outlined its own plans and strategies such as the UAE National Energy Strategy 2050, which sets out targets for clean energy generation and demand reduction.⁵

Transport

Unlike Australia, the United Arab Emirates has ample supply and reserves of liquid fuel. The UAE is home to some of the world's largest oil reserves. Liquid fuel security does not pose an active challenge for the country at present.

The United Arab Emirates may have trouble transitioning its transport sector away from fossil fuel dependence. As a global aviation hub, and home to some of the world's largest airports and airlines, it is a heavy user and producer of aviation fuels. There are plans in place to manage this transition, with Abu Dhabi based carrier Etihad Airways sharing sustainability targets and goals (with the headline target being net zero carbon emissions by 2050). This is planned to be achieved through the development of sustainable aviation fuels and increased aircraft fuel efficiency.⁶

Stationary Domestic Consumption

The UAE is currently heavily reliant on gas for its energy production. It is anticipated that the UAE will begin to transform its electricity generation into a far more diverse and cleaner methods of generation. The country is looking to do this by pursuing methods such as nuclear and solar.

The UAE has an abundance of renewable resources. Solar, whilst currently making up a small part of the UAE's energy mix, is growing quickly, with the UAE looking to take advantage of its extremely high rates of solar exposure.⁷ The country is in the process of constructing large solar plants, and has a plan on how the sector will continue to grow.⁸ The UAE is also growing its nuclear energy sector, opening its first nuclear energy plant in 2020.⁹

The UAE is also exploring waste to energy options, and is currently in the process of developing and constructing a number of waste to energy plants.¹⁰ Waste disposal has been a problem in the UAE for some time, and is anticipated to get worse as the population grows. Waste to energy offers a potential solution to this problem, and additionally helps to diversify the UAE's energy generation mix.

⁵ https://www.irena.org/-/media/Files/IRENA/Agency/Webinars/UAE-Presentation_LTES.pdf?la=en&hash=7AB6DF56E17BE7CE5841CF5015DA9BE55F10C919

⁶ <https://www.etihad.com/en/sustainability/what-we-are-adoing>

⁷ <https://kennedyslaw.com/thought-leadership/article/solar-power-in-the-united-arab-emirates/>

⁸ <https://u.ae/en/information-and-services/environment-and-energy/water-and-energy/types-of-energy-sources/solar-energy>

⁹ <https://www.bbc.com/news/world-middle-east-53619916>

¹⁰ <https://u.ae/en/information-and-services/environment-and-energy/water-and-energy/types-of-energy-sources/waste-to-energy->

Overall, the country has an optimistic domestic energy future, with ample resources, strategies and plans in place to transition away from dependence on natural gas.

Export

The United Arab Emirates' vast natural resources have been a substantial driver of its economy and rapid modernisation. Like Australia, the United Arab Emirates needs to prepare for a world where there is substantially less demand for fossil fuels.

This is a substantial challenges for the UAE given its dependence on oil for such a significant component of its economy. The United Arab Emirates recognises the need to economically diversify as it prepares for a long term post-oil world, as well as increasing its resilience to oil price shocks that will provide more certainty in the short and medium terms.

Active efforts are being made to diversify the UAE economy, and have been for some time. Careful management has allowed the UAE to continue to prosper, even during oil crises. UAE governments have been extremely proactive in setting up the country to succeed. Notably, the country has set itself up as an extremely attractive location for foreign direct investment and tourism. The UAE's internal stability provide substantial amounts of confidence for foreign investors compared to other countries in the region. This is backed by a strong but flexible legal and regulatory environment, as well as advanced infrastructure and innovation.¹¹

Outlook

The United Arab Emirates is being forced to confront a challenge that it has previously not had to deal with. The country is committed to pursuing alternative and renewable energy sources, and acknowledges that they cannot continue to be dependent on fossil fuels.

The biggest challenges for the UAE during this transition will be managing its economy, which has been substantially supported by the export of fossil fuel products since the country's economic transformation. The country continues to pursue active efforts to diversify its economy, and has outlined solid plans that are cause for confidence.

The overall outlook for the country is optimistic. The UAE's pragmatic, innovative and long term approaches to resolving challenges and issues will serve the country well as it manages its future approach to energy security.

Israel

Overview

Israel has long had a highly challenging energy security environment, and has always been dependent on foreign imports to meet its energy requirements. This has changed in recent years, following the discovery of substantial amounts of natural gas.

¹¹ <https://www.kearney.com/foreign-direct-investment-confidence-index/2021-full-report>

Little information is publicly released about Israel's energy supply chains, which has created some challenges when researching and analysing Israel's energy security environment for this paper. Assessments have been made on the best information available, however, unlike Australia, little information is publicly released by authorities about energy supply chains.

Energy needs and challenges

Israel has long been almost completely dependent on imports for its energy needs. This has caused problems for Israel previously, notably when supply of energy has been disrupted as the result of damage to pipelines and other distribution networks, largely a reflection of geopolitical challenges in the area.

Transport

Despite actively encouraging alternative fuels, Israel is heavily dependent on liquid fuel to fulfil its transport energy requirements. To meet this, Israel is dependent on the import of oil, with over 90% of its oil requirements being sourced from offshore.¹²

It is highly difficult to make assessments about the liquid fuel security situation in Israel, as details about the source and supply chains of imported oil is not released, as it is considered to be a national security issue by the Israeli Government.

Israel has two refineries, Hafia and Ashdod, which have a combined capacity of around 300,000 barrels per day.¹³ The refineries import crude oil and other raw materials and refine into petrochemical products. Annual reports from Bazan Group, which operate the larger Hafia Oil Refinery, suggest that the main source of oil is from countries in Asia and Eastern Europe, and particularly notes countries that are in the vicinity of the Black Sea and the Caspian Sea.¹⁴ This suggests a reliance on countries such as Kazakhstan and Russia. Recent quarterly reports from Bazan, released after the outbreak of war between Russia and Ukraine share that the company has not refined crude oil of Russian origins in recent years as it has not been economically viable, however does suggest that they could face logistical difficulties importing from other former USSR countries. Various articles and reports seem to back up the suggestion that countries such as Kazakhstan and Iraq, however there is little firm evidence to verify.¹⁵ Older articles suggest that at one point 25% of Israeli crude oil came from Kazakhstan, however this seems to have reduced, with locations such as the Kurdish region now playing a larger role.

Dependence on imports for oil leave Israel in a vulnerable position, particularly given much of it may be sourced from geopolitically volatile locations. However, based on the extremely limited amount of information available, Israel appears to have a solid understanding of the risk, and has implemented mitigation strategies. The country appears to have a relatively diverse network of supplying countries, and Bazan appears to be picking and choosing its import sources based on economic factors. Furthermore, it is clear that Israel understands the importance of protecting oil supplies as a matter of national security, and hence information about supplies is kept classified.

¹² <https://www.worldometers.info/oil/israel-oil/>

¹³ <https://www.trade.gov/energy-resource-guide-israel-oil-and-gas>

¹⁴ https://eng.bazan.co.il/Media/Uploads/Bazan-annual_report_for_2019.pdf

¹⁵ <https://www.ft.com/content/150f00cc-472c-11e5-af2f-4d6e0e5eda22>

Israeli governments have also been actively encouraging the use of alternative fuels for transport within Israel, with a particular focus on natural gas being used to power vehicles such as trucks and buses. Policymakers should continue to pursue this, as increased diversification will result in a decreased dependence on imported liquid fuels.

Ensuring Israel has a stable supply of liquid fuel should remain an important priority for Israeli policymakers. Israeli Governments should work closely with refinery operators to ensure adequate contingency plans are in place to ensure consistent supply and output is maintained.

Stationary Domestic Consumption

Electricity in Israel is supplied and distributed primarily by the state owned Israel Electric Corporation. Israel's energy is primarily generated by natural gas, following a pivot from coal over the past two decades. Recent discoveries and extraction of natural gas in Israel's economic areas have allowed Israel to be less dependent on energy imports, and has given the country a level of energy security that it has been unable to enjoy previously.

Whilst this is a welcome development, its increased dependency on natural gas also creates new vulnerabilities and challenges for policymakers, particularly around distribution. Once again, information is scarce, however reports indicate that Israel's gas transportation network lacks redundancy and resilience. Reports indicate that it is heavily dependent on a single gas transportation pipeline, which creates a single point of failure should it be impacted by a man-made or natural disaster.¹⁶ Israel must continue to be conscious of vulnerabilities in its natural gas transportation network. Having a secure domestic supply of natural gas is excellent in ensuring energy security, however it means little if it cannot be transported.

To counter and mitigate this threat, Israel should work on diversifying its natural gas distribution network and supply chain, as well as diversifying its energy generation network. Israel has developed a plan to increase the use of renewable methods for energy generation, and has implemented targets to increase the amount of renewable energy in its energy mix, and has recently increased 2030 targets from 17% to 30%.

Export

Now with a natural gas excess, Israel is exploring possibilities surrounding the export of its natural gas offshore. As a long-time importer of energy products, Israel's energy export operations are in their infancy, and thus pose little to no threat to the country should there be a disruption to the export environment.

Outlook

Israel's energy security situation is mixed. Whilst almost entirely dependent on imports of crude oil to meet its liquid fuel needs, the country appears to have an adequate understanding of the risk, and fuel importers appear to have a reasonably resilient network of import channels. The increasing use of alternative fuels in the transport sector will also help to reduce dependence on oil.

Israel's local supply of natural gas has also substantially contributed to greater energy security for the country, however policymakers should continue to work to develop a more resilient energy network by building in

¹⁶ <https://www.inss.org.il/wp-content/uploads/2017/06/memo165.pdf>

increased redundancy. This can be achieved by reviewing distribution networks and diversifying energy generation sources. This is an area that will require careful management as policymakers will need to transition away from traditional power generation methods, whilst simultaneously boosting capacity in line with forecasted population growth

Conclusion

Energy and fuel security is a critical national security issue. It is fortunate to see all three countries recognising this, albeit with varying approaches and levels of commitment.

Australia's largest problem, liquid fuel security, is actively being addressed by the Australian Government, however comprehensive and holistic initiatives towards domestic stationary energy needs have failed to eventuate. The future of Australia's energy export industry is a similarly politically charged issue, with major political parties reluctant to make firm commitments.

Fuel and energy security is not an issue the United Arab Emirates has had to address in recent times owing to its vast supplies of oil. Global decarbonisation efforts are forcing the country to consider what its future looks like beyond fossil fuels, and has plans in place to transition both its own domestic energy needs, as well as its export industry, away from fossil fuels. The UAE's pragmatic and sensible approach, as well as its commitment to innovation and development will serve it well as this transformation evolves.

Whilst such information about Israel is scarce, it recognises the importance of energy security and appears to be in a relatively solid position. The discovery of natural gas reserves has increased Israel's energy security, however policymakers must continue to work to diversify and strengthen methods of generation and transmission.

Whilst all three countries face unique challenges and issues presently, they will also all grapple with similar issues and challenges as they transition away from fossil fuels. There are natural synergies between Australia and the United Arab Emirates as they transition their export economies away from fossil fuels, as well as between Israel and Australia, which both are dependent on imports for their liquid fuel needs. Policy makers and other stakeholders in all three countries should look for such synergies and observe the policies and initiatives of their counterparts, and explore how solutions that work overseas could be adapted to solving issues back home.

Further Reading

Australia United Arab Emirates Business Council: Strengthening Alternative and Renewable Energy Pathways: Investment and collaboration opportunities between Australia and the UAE

https://ausuaeabc.com/wp-content/uploads/2021/11/211124-AUSUAABC_Final-Report_Renewable-and-Alternative-Energies-Working-Group.pdf

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